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EXAMINER				
CHEN, KEATH T				
ART UNIT		PAPER NUMBER		
1792				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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# Office Action Summary

## Application No.

10/556,355

## Applicant(s)

IIZUKA, HACHISHIRO

## Examiner

Keath T. Chen

## Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6 and 8-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6 and 8-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This action is a supplemental action to remove a few editing marks in the previous final office action mailed on 06/16/2008. The expiration date is 3 months from the mailing of this communication.

#### ***Response to Amendment***

The claim amendment filed on 02/27/2008, addressing claims 1-4, 6, and 8-28 rejection from the non-final office action (11/02/2007) by amending claims 1, 6, 8, 17, 19, 23, and 24; and adding new claims 29-37 is entered and will be discussed below.

#### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 35-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 35 and 36 recite "a gas outlet" in line 2, while there is already a gas outlet in the parent claims (1 and 17, respectively).

Claim 35 recites "the filter member" in line 2, there is insufficient antecedent basis for this limitation in the claim.

#### ***Claim Rejections - 35 USC § 102***

The text of those sections of Title 35 U.S. Code not included in this action can be found in a prior Office action.

**3. Claims 1-3, 17-22, 25, 27, and 29-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Naoki et al. (US 6074487, hereafter '487).**

'487 teaches all limitations of:

Claim 1: A vaporizer (Fig. 13, #206) comprising: a vaporizing chamber (S1) configured to vaporize a liquid material (M) and thereby form a gas material (M+X); a spray portion (#205, col. 11, lines 8-10) configured to spray the liquid material in the vaporizing chamber; a delivery part (including #220 and #216, everything outside of chamber S1 is for delivery) configured to deliver the gas material from the vaporizing chamber to a gas outlet; and a heating portion (#215) configured to heat the vaporizer, wherein the delivery part comprises a filter member (#216, porous heating element function as filter, col. 10, lines 55-57) covering the gas outlet (#220) and configured to allow the gas material to pass therethrough, and a heat transfer member (the not labeled columns between 218 and 203) configured to transfer heat of the heating portion (#215) to the filter member (#216, porous heating element function as filter, col. 10, lines 55-57), wherein the heating portion (#215) and the filter member (#216, porous heating element function as filter, col. 10, lines 55-57) are separated from each other (as shown in Fig. 13), and the heat transfer member (the not labeled columns between 218 and 203) is disposed between the heating portion (#215) and the filter member (#216, porous heating element function as filter, col. 10, lines 55-57) and supports the filter member (#216, porous heating element function as filter, col. 10, lines 55-57) (as shown in Fig. 13).

Claim 2: A control member (col. 14, lines 18-20) configured to control temperature of the heating portion (#215) based on temperature of the heat transfer member (the not labeled

columns between 218 and 203) or the filter member (#216, porous heating element function as filter, col. 10, lines 55-57) (thermal coupler #221 connected to the filter, col. 10, lines 35-37).

Claim 3: The heat transfer member (the not labeled columns between 218 and 203) comprises a plurality of heat transfer members (the not labeled columns between 218 and 203).

Claim 29: the filter member (#216, porous heating element function as filter, col. 10, lines 55-57) has a flat shape (#216 has a flat shape on the top of hat shape, col. 10, line 23).

Claim 30: filter member (#216, porous heating element function as filter, col. 10, lines 55-57) has a curved shape (#216 is hat shape, col. 10, line 23).

Claim 31: heat transfer member (the not labeled columns between #218 and #203) is in thermal contact with the filter member (#216, porous heating element function as filter, col. 10, lines 55-57) at a position other than a peripheral portion (as shown in Fig. 13).

Claim 17: A vaporizer (Fig. 13, #206) comprising: a vaporizing chamber (S1) configured to vaporize a liquid material (M) and thereby form a gas material (M+X); a spray portion (#205, col. 11, lines 8-10) configured to spray the liquid material in the vaporizing chamber; a delivery part (including #220 and #216, everything outside of chamber S1 is for delivery) configured to deliver the gas material from the vaporizing chamber to a gas outlet; and a heating portion (#215) configured to heat the vaporizer, wherein the delivery part comprises a plate member (#218) covering the gas outlet (#220) and a wall (#203, upper cover) around the gas outlet, with a gap therebetween to form a communication clearance, such that a gas passage connecting the vaporizing chamber to the gas outlet is formed between the plate member and the wall, a plurality of columns (the not labeled columns between 218 and 203) disposed in the gas passage to serve as a fluid baffle and to support the plate member (not labeled column connect and

support #218), a heater (#218 is also a heater) configured to heat the gas material flowing through the gas passage.

Claim 18: The heater is embedded in the plate member (it is the same part #218).

Claim 19: The plate member has a surface (the bottom side of #218) facing the vaporizing chamber and configured to serve as a vaporizing surface for vaporizing the liquid material (col. 10, lines 17-22, any liquid that may escape through #216 will be vaporized by #218).

Claims 20: a heat transfer member (the not labeled columns between 218 and 203) configured to transfer heat of the heater to the plate member, wherein the heat transfer member (the not labeled columns between #218 and #203) is in thermal contact with the plate member (#218) at a position other than a peripheral portion (The unlabeled columns are inherently capable of transferring heat and contact #218 other than at the peripheral portion).

Claim 21: The plurality of columns serve as the heat transfer member (the not labeled columns are inherently capable of transferring heat and are in contact of #218 other than at the peripheral portion).

Claim 22: A temperature control section (col. 14, lines 18-20) configured to control temperature of the heating portion (#215) based on temperature of the plate member (thermocouple #221 connected to the filter, col. 10, lines 35-37).

'487 further teaches the limitations of claims 25 and 27:

An apparatus (Fig. 1) for performing a semiconductor process on a target substrate, the apparatus comprising: a process chamber (#1, col. 6, lines 58-66) configured to accommodate the

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target substrate; and a gas supply system (#12, Fig. 13 is one embodiment of #12, see drawing description) configured to supply a process gas into the process chamber, wherein the gas supply system comprises the vaporizer according to claim 1 (or 17).

**4. Claims 1-4, 25, 29-30, and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Sun et al. (US 6409839, hereafter '839).**

'839 teaches the limitations of:

Claim 1: A vaporizer (Fig. 11) comprising: a vaporizing chamber ((inlet chamber #154, not labeled, col. 10, line 8, the space above #150) configured to vaporize a liquid material (#14, Fig. 9; Fig. 11 is one instance of the implementation of Fig. 9) and thereby form a gas material (Fig. 9, "gas/vapor mixture", col. 8, line 20); a spray portion (passage #18 entrance to chamber, col. 10, lines 8-10) configured to spray the liquid material in the vaporizing chamber; a delivery part (everything below #150 is for delivery) configured to deliver the gas material from the vaporizing chamber to a gas outlet (opening at the top of #164, col. 10, line 28); and a heating portion (#158, col. 10, line 11) configured to heat the vaporizer, wherein the delivery part comprises a filter member (#160, col. 10, lines 16-17) covering the gas outlet (opening at the top of #164, col. 10, line 28) and configured to allow the gas material to pass therethrough, and a heat transfer member (bottom portion of #148, the horizontal plate, and the part surrounding #160B) configured to transfer heat of the heating portion (#158, col. 10, line 11) to the filter member (#160, col. 10, lines 16-17), wherein the heating portion (#158, col. 10, line 11) and the filter member (#160, col. 10, lines 16-17) are separated from each other (as shown in Fig. 11), and the heat transfer member (bottom portion of #148, the horizontal plate, and the part

surrounding #160B) is disposed between the heating portion (#158, col. 10, line 11) and the filter member (#160, col. 10, lines 16-17) and supports the filter member (#160, col. 10, lines 16-17) (as shown in Fig. 11, right bottom part of #148, some part of the horizontal plate, a portion of the support surrounding #160B are between #158 and #160 in the horizontal direction).

Claim 2: A control member (#104, not labeled in Fig. 9, col. 8, lines 61-65; Fig. 11 is one instance of the implementation of Fig. 9) configured to control temperature of the heating portion (#158, col. 10, line 11) based on temperature of the heat transfer member or the filter member (filter sensor #106A is connected to filter, see Fig. 9).

Claim 3: The heat transfer member (bottom portion of #148, the horizontal plate, and the part surrounding #160B) comprises a plurality of heat transfer members (bottom portion of #148, the horizontal plate, and the part surrounding #160B; at least three).

Claim 4: The vaporizer according to claim 1, further comprising a heater incorporated in the heat transfer member (heater #158 is within the heater transfer heater transfer member #148; furthermore, some more heaters #92A, #96A, #102 are available as separate unit, col. 8, lines 66-67, in such case, #158 is not the only heater).

Claim 25: An apparatus (Fig. 9) for performing a semiconductor process on a target substrate, the apparatus comprising: a process chamber (#26, col. 8, line 24) configured to accommodate the target substrate (col. 8, lines 13-14); and a gas supply system (the rest of Fig. 9) configured to supply a process gas into the process chamber, wherein the gas supply system comprises the vaporizer according to claim 1.

Claim 29: the filter member (#160, col. 10, lines 16-17) has a flat shape (the filter can be circular in shape, circular is a flat disk, col. 10, lines 23-24).



Claim 30: the filter member (#160, col. 10, lines 16-17) has a curved shape (#160 is tubular, col. 10, lines 16-17).

Claim 35: the vaporizer according to claim 1, further comprising a shield plate (#150) covering the filter member (#160, col. 10, lines 16-17) and disposed farther from a gas outlet (opening at the top of #164, col. 10, line 28) than is disposed the filter member (#160, col. 10, lines 16-17).

**5. Claims 24 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by '839.**  
'839 teaches the limitations of:

Claim 24 A vaporizer (Fig. 11) comprising: a vaporizing chamber (inlet chamber #154, not labeled, col. 10, line 8, the space above #150) configured to vaporize a liquid material and thereby form a gas material (col. 10, lines 8-10, note aerosol is fine liquid droplet, still a liquid material); a spray portion (passage #18 entrance to chamber, col. 10, lines 8-10) configured to spray the liquid material in the vaporizing chamber; a delivery part (including #150 and everything below is for delivery) configured to deliver the gas material from the vaporizing chamber to a gas outlet (opening at the top of #164, col. 10, line 28); and a heating portion (#158, col. 10, line 11) configured to heat the vaporizer, wherein the delivery part comprises a filter member (#160, col. 10, lines 16-17), including a first planar surface (circular #160, col. 10, lines 23-24, circular is a flat disk with an upper surface), covering the gas outlet (opening at the top of #164, col. 10, line 28) and configured to allow the gas material to pass therethrough, a heat transfer member (bottom portion of #148, the horizontal plate, and the part surrounding #160B) configured to transfer heat of the heating portion (#158, col. 10, line 11) to the filter member (#160, col. 10, lines 16-17), and a shield plate (block #150 is a thick plate with bores #152, col.

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10, lines 5-8 and line 11), including a second planar surface (the bottom surface of block #150) facing the first planar surface, covering the filter member (#160, col. 10, lines 16-17) farther from the gas outlet (opening at the top of #164, col. 10, line 28) than the filter member (#160, col. 10, lines 16-17) is located, wherein the shield plate (block #150 is a thick plate with bores #152, col. 10, lines 5-8 and line 11) is separated from the filter member (#160, col. 10, lines 16-17) and fixed to the heat transfer member (bottom portion of #148, the horizontal plate, and the part surrounding #160B) along with the filter member (#160, col. 10, lines 16-17) via a spacer (the left part that surrounding #160B, for example) interposed between the shield plate (block #150 is a thick plate with bores #152, col. 10, lines 5-8 and line 11) and the filter member (#160, col. 10, lines 16-17), such that the shield plate (block #150 is a thick plate with bores #152, col. 10, lines 5-8 and line 11) is set in thermal contact with the heating portion (#158, col. 10, line 11) through the heat transfer member (bottom portion of #148, the horizontal plate, and the part surrounding #160B) and the spacer (the left part that surrounding #160B, for example) to receive heat from the heating portion (#158, col. 10, line 11).

Claim 28: An apparatus (Fig. 9) for performing a semiconductor process on a target substrate, the apparatus comprising: a process chamber (#26, col. 8, line 24) configured to accommodate the target substrate (col. 8, lines 13-14); and a gas supply system (the rest of Fig. 9) configured to supply a process gas into the process chamber, wherein the gas supply system comprises the vaporizer according to claim 24.

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35 U.S. Code not included in this action can be found in a prior Office action.

**6. Claims 31 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable by '839.**

'839 teaches all limitations of claim 1 and 24, as discussed above. '839 further teaches the limitations of:

Claims 31: The vaporizer according to claim 1, wherein the heat transfer member (bottom portion of #148, the horizontal plate, and the part surrounding #160B) is in thermal contact with the filter member (#160, col. 10, lines 16-17).

Claim 37: The vaporizer according to claim 24, wherein the heat transfer member (bottom portion of #148, the horizontal plate, and the part surrounding #160B) includes a portion in thermal contact with the filter member (#160, col. 10, lines 16-17).

'839 does not explicitly

Claim 31: (the heat transfer member is in thermal contact with the filter member) at a position other than a peripheral portion.

Claim 37: (the heat transfer member includes a portion in thermal contact with the filter member) at a position other than a peripheral portion.

At the time the invention was made, it would have been obvious for a person having ordinary skill in the art to have added a heater to the filter (#160), as taught in Fig. 9 of '839, along with heat transfer member at various contact point to the heater to improve heat transfer.

The motivation to add heater to filter and heat transfer members to various point of the filter would have been to facilitate better heating function to the filter, as taught by Fig. 9 of '839.

**7. Claim 17-23 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable by '839.**

'839 teaches the limitations of:

Claim 17: A vaporizer (Fig. 11) comprising: a vaporizing chamber (inlet chamber #154, not labeled, col. 10, line 8, the space above #150) configured to vaporize a liquid material (#14, Fig. 9; Fig. 11 is one instance of the implementation of Fig. 9) and thereby form a gas material (Fig. 9, "gas/vapor mixture", col. 8, line 20); a spray portion (passage #18 entrance to chamber, col. 10, lines 8-10) configured to spray the liquid material in the vaporizing chamber (inlet chamber #154, not labeled, col. 10, line 8, the space above #150); a delivery part (including #150 and everything below is for delivery) configured to deliver the gas material from the vaporizing chamber to a gas outlet (opening at the top of #164, col. 10, line 28); and a heating portion (#158, col. 10, line 11) configured to heat the vaporizer, wherein the delivery part comprises (including #150 and everything below is for delivery) a plate member (block #150, col. 10, line 11) covering the gas outlet (opening at the top of #164, col. 10, line 28) and a wall (chamber wall #146C, col. 10, lines 4-5) around the gas outlet, with a gap (outlet chamber #156, col. 10, line 8) therebetween to form a communication clearance, such that a gas passage connecting the vaporizing chamber (inlet chamber #154, not labeled, col. 10, line 8, the space above #150) to the gas outlet (opening at the top of #164, col. 10, line 28) is formed between the plate member

(block #150, col. 10, line 11) and the wall (chamber wall #146C, col. 10, lines 4-5), a column (central support #148, col. 10, line 6) disposed in the gas passage (outlet chamber #156, col. 10, line 8) to serve as a fluid baffle and to support the plate member (central support #148, col. 10, line 6), a heater configured to heat the gas material flowing through the gas passage.

Claim 18: The vaporizer according to claim 17, wherein the heater (#158, col. 10, line 11) is embedded in the plate member (as shown in Fig. 11).

Claim 19: The vaporizer according to claim 18, wherein the plate member (block #150, col. 10, line 11) has a surface (top surface of #150) facing and directly exposed to the vaporizing chamber (inlet chamber #154, not labeled, col. 10, line 8, the space above #150) and configured to serve as a vaporizing surface for vaporizing the liquid material (as shown in Fig. 11).

Claims 20: The vaporizer according to claim 17, further comprising a heat transfer member (central support #148, col. 10, line 6) configured to transfer heat of the heater (#158, col. 10, line 11) to the plate member (block #150, col. 10, line 11), wherein the heat transfer member (central support #148, col. 10, line 6) is in thermal contact with the plate member (block #150, col. 10, line 11) at a position other than a peripheral portion (#148 is at the center of block #150).

Claim 22: The vaporizer according to claim 17, further comprising a temperature control section (#104, col. 8, line 63) configured to control temperature of the heating portion (#158, col. 10, line 11) based on temperature of the plate member (block #150, col. 10, line 11; in proximity of heater which is adjacent to a sensor, col. 8, lines 62-65).

Claim 23: The vaporizer according to claim 17, further comprising a filter member (#160, col. 10, lines 16-17) disposed between the gas outlet (opening at the top of #164, col. 10, line 28)

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and the plate member (block #150, col. 10, line 11) and configured to allow the gas material to pass therethrough (as shown in Fig. 11).

Claim 27: An apparatus (Fig. 9) for performing a semiconductor process on a target substrate, the apparatus comprising: a process chamber (#26, col. 8, line 24) configured to accommodate the target substrate (col. 8, lines 13-14); and a gas supply system (the rest of Fig. 9) configured to supply a process gas into the process chamber, wherein the gas supply system comprises the vaporizer according to claim 17.

Claim 36: The vaporizer according to claim 17, further comprising a shield plate (#160A, col. 10, line 18) covering the filter member (#160, col. 10, lines 16-17) and disposed farther from a gas outlet (opening at the top of #164, col. 10, line 28) than is disposed the filter member (#160, col. 10, lines 16-17, as shown in Fig. 11).

'839 does not teach the limitations of:

Claim 17: a plurality of columns disposed in the gas passage to serve as a fluid baffle and to support the plate member.

Claim 21: The plurality of columns serve as the heat transfer member.

At the time the invention was made, it would have been obvious for a person having ordinary skill in the art to have duplicated the central support in Fig. 11 to multiple support columns.

The motivation to duplicate support columns would have been obvious duplication. '839 discloses the claimed invention except for a plurality of columns. It would have been an obvious matter of design choice to duplicate the columns, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

**8. Claims 6, 8-10, 12-16, 26, and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable by '839.**

'839 teaches the limitations of:

Claim 6: A vaporizer (Fig. 11) comprising: a vaporizing chamber (inlet chamber #154, not labeled, col. 10, line 8, the space above #150) configured to vaporize a liquid material and thereby form a gas material (col. 10, lines 8-10, note aerosol is fine liquid droplet, still a liquid material); a spray portion (passage #18 entrance to chamber, col. 10, lines 8-10) configured to spray the liquid material in the vaporizing chamber; a delivery part (including #150 and everything below is for delivery) configured to deliver the gas material from the vaporizing chamber to a gas outlet (opening at the top of #164, col. 10, line 28); and a heating portion (#158, col. 10, line 11) configured to heat the vaporizer, wherein the delivery part comprises a filter member (#160, col. 10, lines 16-17) covering the gas outlet (opening at the top of #164, col. 10, line 28) and configured to allow the gas material to pass therethrough, and a shield plate (block #150 and heater #158, together, is a thick plate with bores #152, col. 10, lines 5-8 and line 11) covering the filter member (#160, col. 10, lines 16-17) on a side farther from the gas outlet and interposed between the vaporizing chamber and the filter member (#160, col. 10, lines 16-

17) to prevent (hinder or intercept, Thesaurus.com) the gas material, which flows toward the gas outlet, from directly reaching the filter member (#160, col. 10, lines 16-17) while traveling in a straight path from the vaporizing chamber, wherein the filter member (#160, col. 10, lines 16-17) and the shield plate (#150 and #158, together, is a thick plate with bores #152, col. 10, lines 5-8 and line 11) extend in a direction crossing a straight line connecting the spray portion and the gas outlet (this line cross #158 and left side of #160) and the shield plate is separated from the filter member (#160, col. 10, lines 16-17) and covers the filter member (#160, col. 10, lines 16-17).

Claim 8: A space (outlet chamber #156, col. 10, line 8) is disposed between the filter member (#160, col. 10, lines 16-17) and a shield plate (#150 and #158, together, is a thick plate with bores #152, col. 10, lines 5-8 and line 11) to form a heated gas passage (heated by #158) for delivering the gas material to the gas outlet.

Claim 9: A clearance (between the outmost of the plate of #150 and chamber wall) is formed around the shield plate to allow the vaporizing chamber (space above #150) to communicate with the gas passage (outlet chamber #156, which is the space below #150).

Claim 10: An opening (bore #152, col. 10, line 7) is formed in the shield plate (block #150 and heater #158) to allow the vaporizing chamber (inlet chamber #154, not labeled, col. 10, line 8, the space above #150) to communicate with the gas passage (outlet chamber #156).

Claim 12: A control member (#104, not labeled in Fig. 9, col. 8, lines 61-65; Fig. 11 is one instance of the implementation of Fig. 9) configured to control temperature of the heating portion (#158, col. 10, line 11) based on temperature of the shield plate (sensor is adjacent to or in each of the heated element, col. 8, lines 64-65).



Claim 13: The temperature of the filter member or the shield plate is set at substantially the same as the temperature of the heating portion (the shield plate #150 is at substantially the same temperature as the heating portion #158 due to the close proximity).

Applicant's claim requirement "the temperature of the filter member or the shield plate is set at substantially the same as the temperature of the heating portion" is considered intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (*Walter*, 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (*In re Casey*, 152 USPQ 235 (CCPA 1967); *In re Otto*, 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02). When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent (*In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); MPEP 2112.01).

Claim 14: A temperature sensor (sensor is adjacent to or in each of the heated element, col. 8, lines 64-65) disposed at the shield plate (block #150 and heater #158), wherein the control member (#104, col. 8, lines 61-65) is configured to control the temperature of the heating portion (#158, col. 10, line 11) based on a signal detected by the sensor.

Claim 15: A heater (#158, col. 10, line 11) incorporated in the shield plate (block #150 and heater #158, together, is a thick plate with bores #152, col. 10, lines 5-8 and line 11).

Claim 26 (and 28): An apparatus (Fig. 9) for performing a semiconductor process on a target substrate, the apparatus comprising: a process chamber (#26, col. 8, line 24) configured to accommodate the target substrate (col. 8, lines 13-14); and a gas supply system (the rest of Fig. 9) configured to supply a process gas into the process chamber, wherein the gas supply system comprises the vaporizer according to claim 6 (or 24).

Claim 32: The vaporizer according to claim 6, wherein the filter member (#160, col. 10, lines 16-17) has a flat shape (the filter can be circular in shape, circular is a flat disk, col. 10, lines 23-24).

Claim 33: The vaporizer according to claim 6, wherein the filter member (#160, col. 10, lines 16-17) has a curved shape (#160 is tubular, col. 10, lines 16-17).

Claim 34: The vaporizer according to claim 6, wherein the shield plate (block #150 and heater #158, together, is a thick plate with bores #152, col. 10, lines 5-8 and line 11) is interposed between the vaporizing chamber (inlet chamber #154, not labeled, col. 10, line 8, the space above #150) and the filter member (#160, col. 10, lines 16-17) to prevent the gas material, which flows toward the gas outlet (opening at the top of #164, col. 10, line 28), from directly reaching the filter member (#160, col. 10, lines 16-17) while traveling in a straight path from the vaporizing chamber (as shown in Fig. 11).

'839 further teaches shield plate (#150 and #158, together, is a thick plate with bores #152, col. 10, lines 5-8 and line 11) covers and faces the filter member (#160, col. 10, lines 16-17), but the filter member is not facing the shield plate.

'839 further teaches heater in vaporization chamber, filter, flow restriction, and control valve (Fig. 9) and a heater embedded in a wall of the vaporizing chamber (Fig. 10, #126, col. 9, lines 30-33 and line 66 to col. 10, line 2).

'839 does not explicitly teach the limitations of:

Claim 6: (the shield plate cover the filter member) face to face.

Claim 16: The heating portion (Fig. 11, #158, col. 10, line 11) comprises a heater embedded in a wall of the vaporizing chamber.

At the time the invention was made, it would have been obvious for a person having ordinary skill in the art to have added embedded heater to the vaporization chamber wall (claim 16) to Fig. 11, as taught in Fig. 10 of '839; to have added a heater to the filter (#160), as taught in Fig. 9 of '839, along with heat transfer member at various contact point to the heater to improve heat transfer (claim 37); to have rearranged the filter to horizontal direction (claim 6), with a reasonable expectation of success and equal functionality.

The motivation to add embedded heater to chamber in Fig. 11 would have been to facilitate better heating function, as taught by Fig. 10 of '839. The motivation to add heater to filter and heat transfer members to various point of the filter would have been to facilitate better heating function to the filter, as taught by Fig. 9 of '839. The motivation to rearrange the filter is taught by '839 (filter can be arranged as desired, col. 10, lines 23-24). It is well established that the rearrangement of parts is considered obvious to those of ordinary skill (In re Japikse, 181

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F.2d 1019, 86 USPQ 70 (CCPA 1950); In re Kuhle, 526 F.2d 553, 188 USPQ 7 (CCPA 1975); Ex parte Chicago Rawhide Manufacturing Co., 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984); MPEP 2144.04).

Furthermore, in case applicant argues that #158 is not part of shield plate, Fig. 11 is not drawn to scale. By optimize dimension of various parts and depends on design choices, the line between the spray portion and outlet can obviously cross plate #150.

**9. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over ‘839, further in view of Zhao et al. (US 20030033978, hereafter ‘978).**

‘839 teaches all limitations of claim 10, as discussed above. ‘839 also states multiple filter #160 can be used (col. 10, lines 16-17) and arranged as desired (col. 10, lines 23-24).

‘839 does not teach the limitation of claim 11:

The opening comprises a slit, which is bent in a thickness direction of the shield plate.

‘978 is an analogous art in the field of vaporizer for CVD, particularly in solving the problem of clogged vaporizer with unvaporized precursor ([0008], lines 6-10, similar to the temperature uniformity and particulate formation problem ‘839 is solving, col. 2, lines 17-22). ‘978 teaches the use of several tubes with varying porosities with sintered material having circuitous through-passages ([0051], lines 23-28). ‘978 further provides motivation “a vaporizer with increased surface area which exposes the mixture to a large area of evenly heated surfaces and filters out liquid droplets entrained in the flow” ([0091], lines 2-7).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have combined ‘978 with ‘839. Specifically, to have provided multiple sintered

porous plates in Fig. 11 of '839 (instead of just one filter #160) for the purpose to provide increased surface area to filter out liquid droplets, with a reasonable expectation of success.

In the above arrangement, the innermost sintered porous plate would have functioned as the filter while the outer sinter porous plates as "shield plates" to protect the inner plate. The outer sintered porous plates (the shield plates) would have had numerous pores with some slits bent in a thickness direction.

### *Response to Arguments*

Applicant's arguments filed 02/27/2008 have been fully considered but they are not persuasive.

10. Applicant's arguments with respect to claims 1-4, 6, 8-28 have been considered but are unconvincing in view of the new ground(s) of rejection.

### *Conclusion*

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Keath T. Chen whose telephone number is 571-270-1870. The examiner can normally be reached on M-F, 8:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. T. C./  
Examiner, Art Unit 1792

/Michael Cleveland/

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Supervisory Patent Examiner, Art Unit 1792